



# North American Mixing Forum



## Mixing XXII Conference

June 20-25, 2010 • Hotel Grand Pacific • Victoria, British Columbia, Canada  
[www.mixing.net/Conferences/mix22/index.htm](http://www.mixing.net/Conferences/mix22/index.htm)

## PROGRAM

### SUNDAY, JUNE 20

Time	Title	Author / Presenter	Affiliation
9 AM - 2 PM	Mixing Short Course ( <i>South Pender Island Ballroom</i> )		
10 AM - 2 PM	NAMF Executive Council Meeting ( <i>Room 612</i> )		
2:30 - 6 PM	Registration ( <i>Lobby area</i> )		
5:00 PM	Social hour and welcome dinner ( <i>Vancouver Island Ballroom</i> )		
<i>All Conference Sessions in the Pender Island Ballroom   All meals in Vancouver Island Ballroom   All social hours held on the second floor</i>			
<b>SESSION 1: Fundamentals on mixing technology and mixing education</b>		<b>Chairs: R. Calabrese and J. Gilchrist</b>	
7:00 PM	Opening Comments from Conference Chairs	Suzanne Kresta Clara Gomez	University of Alberta University of British Columbia
7:05 PM	PLENARY: Mixing and Age Distribution in Chemical Reactors: 50 Years After Danckwerts and Zwietering	Minye Liu	DuPont Company
7:50 PM	Measuring the Scale of Segregation in Mixing Applications	Alena Kukukova	University of Alberta
8:15 PM	A Comparison of Top Entry vs. Side Entry Agitator Performance in Low Viscosity Blending	Richard Kehn	SPX LIGHTNIN, NY
8:40 PM	Break		
9:00PM	Laboratory and Table-Top Fluid Mixing Experiments for the Laboratory or Classroom	William Roy Penney	Dep. Chem. Eng., University of Arkansas
9:25 PM	Mixing Time Study for Wide Range of Fluid Viscosity	Katsuhide Takenaka	Sumitomo, USA
9:50 - 11:00 PM	Social Hour and Exhibit ( <i>2 floor</i> )		

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## MONDAY, JUNE 21

Time	Title	Author/ Presenter	Affiliation
7:00 - 8:00 AM	Breakfast		
<b>SESSION 2: Mixing of solids I</b>		<b>Chairs: K. Myers and D. Brown</b>	
8:00 AM	PLENARY: Slurry Pipeline Flows: Coarse Behaviour From Some Otherwise Fine Particles	Sean Sanders	University of Alberta, Canada
8:45 AM	Solids Suspension in Tall Tanks	Richard F. Cope	The Dow Chemical Company
9:10 AM	Pulse Jet Mixers- The Known and Unknown about Solids Suspensions	David Dickey	MixTech Inc.
9:35 AM	Effect of a High Shear Homogenizer on Mixing Time in a Fully Baffled Stirred Tank	Micaela Caramellino (student finalist)	New Jersey Institute of Technology
10:00 AM	Break		
10:20 AM	Experimental and Computational Characterization of Flow and Mixing Behaviour in a Continuous Powder Mixer	Fernando Muzzio	Chem & Biochem Eng., Rutgers University
10:45 AM	Solving Granular Segregation Problems Using a Vial Rotary Mixer	Bodhisattwa Chaudhuri	Pharmaceutical Sciences, Univeristy of Conneticut
11:10 AM	An Investigation of the Mixing and Segregation of Powders in a Spheronizer	Francois Bertrand	Chem. Eng., Ecole Polytechnique de Montreal
11:35 AM	Solid Velocity Profiles Using UVP and CFD Simulations	Madhavi Sardeshpande	National Chemical Laboratory, India
12:00 - 1:00 PM	Lunch		

5:00 - 5:40 PM Social Hour and Exhibit

5:40 - 7:00 PM Dinner

Time	Title	Author/ Presenter	Affiliation
<b>SESSION 3: In line mixers and micro mixing</b>		<b>Chairs: M. Liu and E. Galindo</b>	
7:00 PM	Segregation of Suspensions in Microscale In-line Mixers	James F. Gilchrist	Dept. Chem. Eng., Lehigh University
7:25 PM	Novel Transfer Inline Mixing Process and Mixer Based Receptivity	Guiren Wang	Mech & Biomed Eng., University of South Carolina
7:50 PM	The Effect of Surfactants on the Breakup of and Axisymmetric Laminar Jet	Justin Walker (student finalist)	University of Maryland
8:15 PM	Break		
8:35 PM	Scaling Up of Silverson Rotor-Stator Mixers	Steven Hall	School of Chem. Eng., University of Birmingham
9:00 PM	Flow and Power Characteristics of Three Types of Rotor-Stator Heads	Gul Ozcan	DOMINO, BHR Group
9:25 PM	Characteristics of Rotor-Stator Batch Mixer Performance Elucidated by Shaft Torque and Angle Resolved PIV Measurements	HansHenrik Mortensen	Tetra Pak Scanima

9:50 - 11:30 PM Social Hour and Exhibit

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## TUESDAY, JUNE 22

Time	Title	Author/ Presenter	Affiliation
7:00 - 8:00 AM	Breakfast		
<b>SESSION 4: CFD of mixing processes</b>		<b>Chairs: O. Akiti and J. Spinti</b>	
8:00 AM	PLENARY: A Mix of Computational Techniques for a Better Blend	Francois Bertrand	Chem. Eng., Ecole Polytechnique de Montreal
8:45 AM	Blending of Liquids with Density Differences	Jos Dersken	Chem. & Materials Eng. University of Alberta
9:10 AM	Stochastic Simulation of Crystal Particle Attrition Based on the Statistic of the Lagrangian Particle Simulation in a Stirred Vessel	Ryuta Misumi	Material Sci & Chem. Eng., Yokohama University, Japan
9:35 AM	Simulation of an Opposed Jet, Process Flow Geometry and its Experimental Verification	Robert S. Brodkey	Chem & Biomolec. Eng., Ohio State University
10:00 AM	Break		
10:20 AM	An Investigation of Numerical and Modeling Issues Regarding CFD Predictions of Velocity in a Stirred Tank with the RANS k-w Turbulence Model	Peter Farber	IMH - Institute of Modeling and High performance computing, Hochschule Niederrhein, Germany
10:45 AM	Direct Numerical Simulations and Large Eddy Simulations of the Turbulent Flow in a Baffled Tank Driven by a Rushton Turbine	Harry van den Akker	University of Technology - Delft
11:10 AM	Ongoing Studies of the Flow in Annular Centrifugal Contactors	Kent E. Wardle	Chem Sci & Eng. Division, Argonne National Laboratory
11:35 AM	Computational Fluid Dynamics Simulation of a Quadrupole Magnetic Sorter Flow Channel	Thomas R. Hanley	Chem Eng., Auburn University
12:00 - 1:00 PM	Lunch		

5:00 - 5:40 PM Social Hour and Exhibit

5:40 - 7:00 PM Dinner

## SESSION 5: Experimental methods

Chairs: G. Padron and G. Zhou

7:00 PM	The use of Physical Modelling to Investigate Complex Industrial Mixing Problems	Darwin Kiel	Coanda Research & Development
7:25 PM	Mixer Performance Characteristics: Impeller and Process Efficiency	David A.R. Brown	BHR Group
7:50 PM	The Effect of Process Variables on Blend Time in a Continuous Stirred Tank	Joelle Aubin	Laboratory of Chemical Engineering - University of Toulouse
8:15 PM	Break		
8:35 PM	Comparison Between Electrical Resistance Tomography, CFD and Other Measurement Techniques for Gas-Liquid Mixing	Jonathan Ritson	Industrial Tomography Systems
9:00 PM	Understanding Multiphase Dispersions Occurring in Bioprocesses	Enrique Galindo	Universidad Nacional Autonoma de Mexico
9:25 PM	Suspension of Slurries with Solids of Mixed Densities	Arthur W. Etchells	Etchells & Rowan University, NJ.

9:50 - 11:30 PM Social Hour and Exhibit

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## WEDNESDAY, JUNE 23

Time	Title	Author/ Presenter	Affiliation
7:00 - 8:00 AM	Breakfast		

### SESSION 6: Mixing of multiphase systems

Chairs: A. Etchells and T. Hutchinson

8:00 AM	PLENARY: Lessons from mixing in fluidized beds and related systems	John Grace	University of British Columbia
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8:45 AM	An Improved Correlation to Predict "Just Suspension" Speed for Solid-Liquid Mixtures with Axial Flow Impellers in Stirred Tanks	Richard K. Grenville	DuPont Engineering
9:10 AM	Effect of Geometry Variations on the Performance of Gas Dispersion Impellers with Semicircular Blades	Julian Fasano	Mixer Engineering Company
9:35 AM	Effect of Rheology on $K_{La}$ and Mixing Time in 42 & 340L Stirred Reactors	Frederic Augier	IFP - Lyon (Process Development and Engineering Division)

10:00 AM	Break		
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10:20 AM	Low Frequency Acoustic Mixing of Complex and Multiphase Systems	Peter Lucon	Resodyn Corporation
10:45 AM	Gas Handling and Power Consumption of High Solidity Hydrofoils: Philadelphia Mixing Solutions' HS and Lightning's A315 Impellers	Thomas Post	Post Mixing Optimization and Solutions
11:10 AM	Effect of Dispersed Phase Fraction on Drop Size in Immiscible Liquid-Liquid Dispersions: Coalescence or Turbulence Damping?	Gustavo Padron	BHR Group
11:35 AM	Experimental and Numerical Investigations of Drop Size Distributions in Stirred Liquid-Liquid Systems	Stephanie Hermann	TU Berlin

12:00 - 1:00 PM	Lunch		
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### 4:00 - 5:40 PM POSTERS

Social Hour and Exhibit

Chairs: Hahn Vo and Kishore Kar

5:40 - 7:00 PM	Dinner		
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### SESSION 7: Mixing and chemical reaction

Chairs: R. Schisla and R.Cope

7:00 PM	Correlation of Reaction Yield on Suspended Catalysts	Gary K. Patterson	Chem. & Bio. Eng., Missouri University
7:25 PM	Solids Suspension and Mixing Time in a Torispherical-Bottomed Pharmaceutical Reactor Under Different Baffling Conditions	Piero M. Armenante	New Jersey Institute of Technology
7:50 PM	Effect of Geometry on the Mechanisms for off-Bottom Solids Suspension	Inci Ayaranci (student finalist)	University of Alberta

8:15 PM	Break		
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8:35 PM	Oxy-Gas Combustion for Efficient CO <sub>2</sub> Capture: Effect of Near Burner Mixing on Velocity and Composition Fields	Jennifer P. Spinti	Institute for Clean and Secure Energy, University of Utah
9:00 PM	A New Diagnostic: Mixing Sensitive Chemistry with Phase Change	Patil Pramod	The Dow Chemical Company
9:25 PM	Micromixing in Two-phase (g-l and s-l) Systems in a Stirred Vessel	Julia Hofinger	School of Chem. Eng., University of Birmingham

### 9:50 - 11:30 PM Social Hour and Exhibit

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## THURSDAY, JUNE 24

Time	Title	Author/ Presenter	Affiliation
7:00 - 8:00 AM	Breakfast		

### SESSION 8: Industrial mixing

Chairs: L.Fradette and D. Dickey

8:00 AM	PLENARY: Stirred, Not Shaken; Mixing Myths in the Process Industries	Alvin Nienow	School of Chem. Eng., University of Birmingham
8:45 AM	Novel Design for a Magnesium-Enhanced Lime Ex-Situ Gypsum Crystallizer	Chris Hibshman	Philadelphia Mixing Solutions
9:10 AM	Energy Efficient Mixing in Anaerobic and Anoxic Tanks	Marcus Hoefken	INVENT Umwelt-und Verfahrenstechnik AG, Germany
9:35 AM	Measurement and Interpretation of Cavitation and Noise in a Hybrid Hydrodynamic Cavitating Device	Ke-ming Quan	Procter & Gamble Company
10:00 AM	Break		
10:20 AM	Design of Agitated Pulp Stock Chests with Side-Entering Impellers	Clara Gomez	Department of Chem. & Biol. Engineering, UBC
10:45 AM	CFD Modeling of Erosion of a Solid Bed by Jet Impingement	Brigette Rosendall	Bechtel National Inc.
11:10 AM	Effect of Rheology on the Performance of Maxblend and Superblend Mixers	Louis Fradette	Chem. Eng., Ecole Polytechnique de Montreal
11:35 AM	Energy Savings Option by Modified Stirrer Configuration and Aeration Strategy	Piet Brocken	DSM, the Netherlands
12:00 - 1:00 PM	Lunch		

### 4:00 PM POSTERS

Social Hour and Exhibit

Chairs: Hahn Vo and Kishore Kar

### 5:30 - 7:30 PM AWARDS DINNER (starting with NAMF General meeting 5:30 - 6:00 PM)

### SESSION 9 : CFD Modeling and validation

Chairs: F. Bertrand and S. Jaffer

7:30 PM	Wall Shear Stress in an Orbiting Culture Dish Using CFD with PIV Validation	R. Eric Berson	Chemical Engineering, University of Louisville
7:55 PM	Modeling surface gas transfer in agitated vessels using Computational Fluid Dynamics.	Nulu Suresh	Amgen
8:20 PM	Modeling Cavitation in a High Intensity Agitation Flotation Cell	July K. Jose	Chem. & Materials Eng. University of Alberta
8:45 PM	Break		
9:00 PM	Comparing Two Experimental Techniques and Modeling to Validate Mixing Time in a Dual Impeller Agitated Vessel	Olli Visuri	Biotech. & Chem. Tech., Aalto University, Finland
9:25 PM	Estimation for the Prediction of Agglomeration Rate in Emulsion Polymerization	Koji Takahashi	Chem. Eng., Yamagata University, Japan
9:50 - 11:30 PM	Social Hour and Exhibit		

## FRIDAY, JUNE 25

### Time

8:00 - 11:00 AM Farewell brunch